

1. A process for bonding an array of pile loops stitched onto a surface of a backing, each pile loop having a root portion that is held to the surface of a backing by a stitching thread, the process comprising:

5 applying a thermoplastic binder material having a predetermined melting point in the vicinity of the root portion of the loops;

10 mechanically flexing the backing with the loops thereon into and out of the plane of the backing at a temperature greater than the melting point of the binder,

thereby to cause the binder material to melt and to flow into the root portion of the pile loops in the vicinity of the stitching thread underlaps.

15 2. The process of claim 1 wherein the thermoplastic binder material is applied to the surface of the backing.

3. The process of claim 1 wherein the temperature is maintained by immersing the backing with the pile loops thereon in a liquid having a temperature greater than the melting point of the binder.

4. The process of claim 3 further comprising the step: after immersion in the liquid, drying the backing.

25 5. The process of claim 4 wherein the backing is dried at a temperature of at least one hundred ten degrees Centigrade (110 °C) for at least 2 minutes.

30 6. The process of claim 1 wherein the temperature is maintained by passing steam over the backing with the pile loops thereon.

35 7. The process of claim 1 further comprising the step: after passing steam over the backing, drying the backing.

8. The process of claim 7 wherein the backing is dried at a temperature of at least one hundred ten degrees Centigrade (110 °C) for at least 2 minutes.

5 9. The process of claim 1 wherein the temperature is maintained by passing over the backing a heated gas having a temperature greater than the melting point of the binder.

10 10. The process of claim 1 further comprising the step: prior to mechanically flexing the backing, scouring the pile loops to remove substantially all oil and finish therefrom.

15 11. The process of claim 6 further comprising the step: prior to mechanically flexing the backing, scouring the pile loops to remove substantially all oil and finish therefrom.

20 12. The process of claim 9 further comprising the step: prior to mechanically flexing the backing, scouring the pile loops to remove substantially all oil and finish therefrom.

25 13. The process of claim 2 wherein the thermoplastic binder is an amorphous binder in the form of a powder having particle sizes in the range of one (1) to five hundred (500) microns, the powder binder having a melting point in the range from about eighty-five (85) to about one hundred degrees Centigrade (100 °C).

30 14. The process of claim 13 wherein the powder binder is applied to the backing in a dry state,

35 wherein the process further comprises the step of: after application of the powder binder, heating the surface of the backing to a temperature greater than the melting point of the powder binder thereby to melt the powder binder to attach it to the surface of the backing.

15. The process of claim 13 wherein the powder binder is applied to the backing in a melt-blown dry state.

5       16. The process of claim 13 wherein the powder binder is applied to the backing in the form of a slurry comprising the binder powder dispersed in a liquid vehicle,

wherein the process further comprises the step of:

10              after application of the binder slurry, heating the surface of the backing to a temperature greater than the melting point of the powder binder thereby to melt the powder binder to attach the same to the surface of the backing.

15       17. The process of claim 13 wherein the powder binder is applied to the backing in the form of a slurry comprising the binder powder dispersed in a liquid vehicle, the liquid vehicle having a soluble adhesive dissolved therein,

20              the soluble adhesive having a setting point in the range from five (5) to twenty (20) degrees Centigrade °C below the melting point of the binder,

25              wherein the process further comprises the step of:

            after application of the binder slurry, heating the surface of the backing to a temperature greater than the setting point of the soluble adhesive but below the melting point of the powder binder thereby to attach the powder binder to the surface of the backing.

30       18. The process of claim 17 wherein prior to mechanically flexing the backing the formed pile structure is soaked in water for at least one (1) minute.

35       19. The process of claim 13 wherein the thermoplastic binder powder is mixed with a secondary thermoplastic adhesive powder having particle sizes in the range of one (1) to five hundred (500) microns, the dry powder

adhesive having a melting point in the range from five (5) to twenty (20) degrees Centigrade °C below the melting point of the binder.

5        20. The process of claim 19 wherein the mixture of powder binder and a secondary thermoplastic adhesive powder is applied to the backing in a dry state, wherein the process further comprises the step of: after application of the powder mixture, heating the surface of the backing to a temperature greater than the melting point of the secondary thermoplastic adhesive powder thereby to melt the a secondary thermoplastic adhesive powder to attach the powder binder to the surface of the backing.

10        21. The process of claim 19 wherein the mixture of powder binder and the secondary thermoplastic adhesive powder is applied to the backing in the form of a slurry comprising the binder powder and the secondary thermoplastic adhesive powder dispersed in a liquid vehicle, wherein the process further comprises the step of: after application of the slurry, heating the surface of the backing to a temperature greater than the melting point of the secondary thermoplastic adhesive powder thereby to melt the secondary thermoplastic adhesive powder to attach the binder powder to the surface of the backing.

15        25        30        35        22. The process of claim 2 wherein the binder is in the form of a strand of binder material that is laid into the vicinity of the root portions of the pile loops.

20        25        30        35        23. The process of claim 22 wherein the binder strand is disposed under the underlaps.

24. The process of claim 22 wherein the binder strand is disposed between the root portions of the pile elements and the backing.

5        25. The process of claim 22 wherein the stitching threads includes a binder material.

10      26. The process of claim 22 wherein the binder strand is weft-inserted between the root portions of the pile elements and the backing.

15      27. The process of claim 22 wherein the backing has an upper and a bottom surface thereon and an open structure adapted to permit a liquid slurry to penetrate therethrough, and wherein the binder material is applied in the form of a liquid slurry to the bottom surface of the backing.

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